

SP-010

Load Cell Smart Probe



- Autoscaling 350 ohm - 5000 ohm Bridge Input Circuits
- Auto adjusted activation current
- Hardware and software TARE function
- 2-point Linearization
- Modular M12 construction
- OMEGA Smart Core enabled
 - Data Logging
 - Integrated Alarm and Control
 - Plug and Play Device Detection
 - Sensor health monitoring



The Layer N SP-010 Load Cell Smart Probe provides an easy way to integrate your bridge devices to the Layer N Ecosystem. The SP-010 accepts 4-wire bridge sensors through its M12 4-pin connector and Layer N Smart Interfaces through its M12 8-pin connector. The M12-S-M-FM accessory connector can be utilized to easily connect wire leads to your SP-010.

The SP-010 determines the bridge impedance and applies an optimized pulsed bridge excitation current during measurements to minimize self-heating effects. The bridge voltage is then used to determine the applied force using bridge characteristics provided by the user.

A 2-point linearization correction may be applied with the ability to capture the measured values. TARE weight adjustment can be triggered through software or external switch closures.

Intuitive Configuration

Configure your Layer N Smart Probe using SYNC's intuitive configuration interface. Additionally, an integrated command line interface allows for quick serial setup of your Smart Probe and Smart Interface using standard terminal emulators.

Edge Control and Built in I/O

The Layer N SP-010 features 2 configurable digital I/O pins. These can be used for a myriad of applications including driving relays, physical alarms, or sensing dry contacts like door switches. The SP-010 can also be utilized as an edge controller, with autonomous independent decision-making capabilities to generate local alarms or provide control outputs based on sensor inputs.

Smart Core Enabled

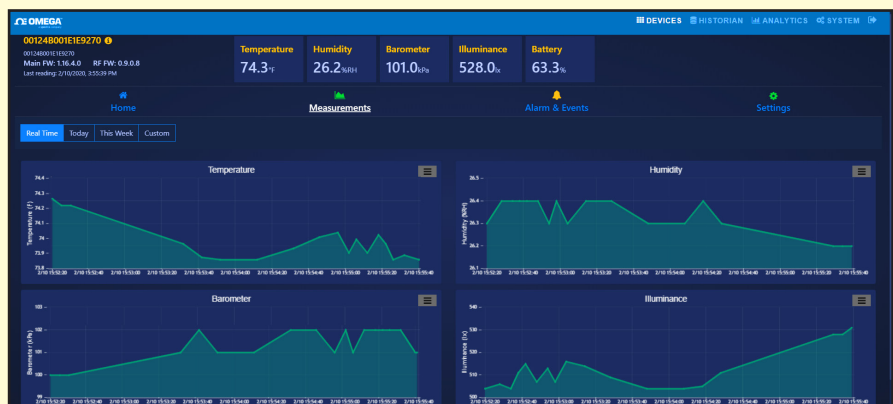
Smart Core is integral to all Layer N Smart Probes. This powerful suite of advanced features enable plug and play connectivity, alarms and notifications, data assurance, data logging, and storage.

Smart Interface Modularity

Customize your Layer N Ecosystem with modular Smart Interfaces that connect and transmit data from your Smart Probe to the Layer N Cloud.

Your Data at a Glance with Layer N Cloud

Layer N Cloud consolidates and brings your data to you when you need it, wherever you are. The intuitive cloud interface allows you to monitor and store your data, set alarms and alerts, and provides insights on device activity. Visit the OMEGA website for more details.



Specifications

INPUT POWER

Voltage: $2.8 V_{DC} - 3.3 V_{DC}$

DIO DIGITAL INPUTS

$V_{inHighThreshold} = 2.2 V_{MAX}$

$V_{inLowThreshold} = 0.3 V_{MIN}$

$V_{inMAX} = 30 V_{DC}$

DIO DIGITAL INPUTS

2x Open Drain 100 mA max

$V_{MAX} = 30 V_{DC}$

MEASUREMENTS

Supported Strain Gauges

Bridge Sensitivity: 1 to 15 mV/V

Bridge Resistance: 250 to
15000 Ohm

Accuracy

Linearity Error: $\pm 0.03\%$ FSO

Thermal Error: $\pm 0.005\%$ FSO/C

ENVIRONMENTAL

Operating Temperature: -40 to
85°C (-40 to 185°F)

Rating: IP67 when mated

MECHANICAL

Dimensions: 22.1 mm W x 96.7
mm L (0.87" x 3.80") not including
mounting tabs

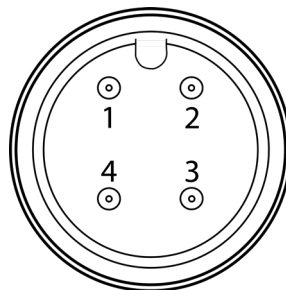
GENERAL

Agency Approvals: CE, EMC
2014/30/EU, LVD 2014/35/EU

Compatibility: Compatible with
OEG, SYNC configuration software,
Layer N Cloud, and Modbus
Networks

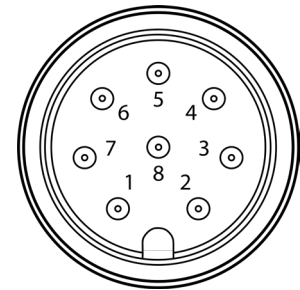


M12 4-Pin Wiring



Pin	Name	Function
Pin 1	Exc -	Excitation return
Pin 2	Sense +	Bridge Output
Pin 3	Sense -	Bridge Output
Pin 4	Exc +	Bridge Excitation

M12 8-Pin Wiring



Pin	Name	Function
Pin 1	DIO 0	Discrete I/O Signal 0
Pin 2	INTR	Interrupt Signal
Pin 3	SCL	I2C Clock Signal
Pin 4	SDA	I2C Data Signal
Pin 5	Shield	Shield Ground
Pin 6	DIO 1	Discrete I/O Signal 1
Pin 7	GND	Power Ground
Pin 8	3.3VDD	Power Supply

Layer N SP-010

Model Number	Description
SP-010-1	Load Cell Smart Probe with discrete I/O

Layer N Smart Interface

Layer N Smart Probes require a Layer N Smart Interface to operate and connect to your Layer N Ecosystem. There are both wired and wireless options.

Model Number	Description
IF-001	USB Smart Interface
IF-002	RS485/Modbus Smart Interface

Accessories

An optional M12 4-pin screw terminal adapter is available for users who wish to connect wire leads directly to the SP-010-1.

Model Number	Description
LCKD	Subminiature Load Cell with Rugged Industrial Design
M12-S-M-FM	M12 4-pin screw terminal adapter
M12.8-T-SPLIT	Smart Probe M12-8 pin shielded T-Splitter - enables access to I/O pins
M12.8-S-M-FM	M12-8 pin Straight Plug Field install connector with screw terminals
DM12CAB-8-1-RA	1m (3.3') cable dual M12-8 connector, right angle terminator
DM12CAB-8-3-RA	3m (9.8') cable dual M12-8 connector, right angle terminator
DM12CAB-8-5-RA	5m (16.4') cable dual M12-8 connector, right angle terminator
DM12CAB-8-1	1m (3.3') cable dual M12-8 straight connector
DM12CAB-8-3	3m (9.8') cable dual M12-8 straight connector
DM12CAB-8-5	5m (16.4') cable dual M12-8 straight connector



LCKD

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M12-S-M-FM

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SP-010-1

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IF-001